CENTERS FOR DISEASE CONTROL

MMWR

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Perspectives in Disease Prevention and Health Promotion

Workshop on Epidemiologic and Public Health Aspects of Physical Activity and Exercise

In response to increased evidence that regular physical activity produces substantial physical and emotional benefits, the U.S. Public Health Service has specified "Physical Fitness and Exercise" as one of the 15 areas of greatest importance for improving the health of the public (*1,2*).

To provide the public health and scientific communities with a summary of the current knowledge in this area and with recommendations for future research, CDC organized the preparation of 10 scientific papers and conducted a Workshop on the Epidemiologic and Public Health Aspects of Physical Activity and Exercise on September 24-25, 1984. The papers, all of which are published in the March-April issue of *Public Health Reports** (*3-12*), and workshop deliberations are summarized below.

SUMMARIES OF THE INDIVIDUAL PAPERS

1. **Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research** (*3*). Physical activity is movement produced by skeletal muscles that results in energy expenditure. Exercise is a subset of physical activity that is planned, structured, repetitive, and has the improvement or maintenance of physical fitness as an objective. Physical fitness is a set of attributes, some of which are health related, that people have or achieve. Extra attention was given to "exercise" because it often is used interchangeably with "physical activity"; however, common usage suggests that exercise has characteristics that separate it from many other physical activities.

The main thrust of the paper is that physical activity has many dimensions or components. To evaluate and compare published reports, investigators need to recognize and describe the specific components of the physical activity they have studied.

2. **Assessment of physical activity in epidemiologic research: problems and prospects** (*4*). Physical activity is a complex behavior with many interrelated dimensions. It has been measured in a variety of ways ranging from direct calorimetry to a single query about how active one is. Each method captures only part of the entire physical activity spectrum. In addition, different dimensions of activity may be related to different dimensions of health. Therefore, the specific concerns of a survey or study determine the most appropriate method. At present, recall procedures seem the best method for large population studies.

In spite of the many methods currently in use, little has been done to determine the reliability and validity of the various measurement methods. This crucial area must receive more attention to assure the accuracy of research efforts.

*Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, for $5.00 per issue.

Physical Activity and Exercise — Continued

3. **A descriptive epidemiology of leisure-time physical activity** (*5*). Inconsistent and inadequately detailed measurement of activity in population surveys badly hampers a thorough description of the active population. It appears, however, that, during their leisure time, only about 20% of adults perform the amount of physical activity generally recommended for cardiovascular fitness. In the United States, leisure-time physical activity is positively associated with male sex and socioeconomic status and inversely associated with age.

4. **The determinants of physical activity and exercise** (*6*). The factors causally associated with a physically active lifestyle are poorly understood. The behavior is determined, at least in part, by characteristics of the person, the environment, and the activity itself. Important differences in determinants probably exist between the adoption and the maintenance of activities and between supervised and unsupervised activities. Whereas the paper describes many potentially predictive associations, the final conclusion is that the determinants of physical activity are very uncertain. Previous experience in sports, family and peer support, self-motivational characteristics, and positive feelings resulting from the activity seem important; the evidence supporting the importance of accessible facilities, time restraints, and various climatic conditions is less conclusive.

5. **Relationships between exercise or physical activity and other health behaviors** (*7*). The expectation that physical activity, particularly exercise, may favorably influence other important health behaviors is firmly established only for weight control. In other areas, such as for smoking cessation, the evidence to date is only suggestive. Reported associations are small, insignificant, or both, and causality cannot be determined. Research in this area is hampered not only by the difficulties of measuring physical activity but also by those of measuring the other behaviors.

6. **The disease-specific benefits and risks of physical activity and exercise** (*8*). Habitual vigorous physical activity reduces the risk of coronary heart disease (CHD) and sudden death. The reduction is the result of protection and not merely the selection of less-susceptible individuals. The protective effect is independent of other risk factors, such as hypertension, obesity, smoking, and family history, and may actually provide relatively more protection for those with hypertension and obesity than those without these risk factors. The temporarily increased risk of sudden death during vigorous physical activity is outweighed by the overall reduced risk of CHD from habitual vigorous activity. Several studies suggest that habitual exercise or physical activity may prevent or control hypertension, osteoporosis, or Type II diabetes. Little or no information is available on the effect of habitual activity on cancer, respiratory diseases, or arthritis.

For each of the disorders, the dose-response effect needs to be explored in more detail. It is of great importance to determine the effects of beginning an exercise program in early, middle, or later life. Distinction needs to be made between the effect of vigorous physical activity and that of less-vigorous activity performed over a longer period of time, yet results in an equivalent expenditure of energy.

7. **The risks of exercise: a public health view of injuries and hazards** (*9*). The potential hazards of physical activity or exercise are many. They may be acute or chronic, mechanical, metabolic, or psychologic. They may be specific to the activity, to the age or sex of the participant, or to both. Data permitting the calculation of incidence rates for any of these potential problems are essentially nonexistent. Even for the six most commonly reported aerobic activities among U.S. adults—walking, jogging, swimming, cycling, calisthenics, and racket sports—there is almost no information about the incidence of acute mechanical injuries, let alone metabolic, psychologic, or chronic effects.

Physical Activity and Exercise – Continued

8. **The relation of physical activity and exercise to mental health** (*10*). The beneficial effects of physical activity or exercise on various aspects of mental health are potentially large. Unfortunately, few studies have been performed or reported with sufficient care that valid conclusions can be drawn. Physical activity and exercise do alleviate the symptoms of mild to moderate depression and, in the general population, reduce the symptoms of anxiety. Particularly fruitful areas of research are in the areas of substance abuse, psychologic stress, and coronary-prone (Type A) behavior.

9. **Physical activity and exercise to achieve health-related physical fitness components** (*11*). Physically active persons have fewer health problems. The most diverse benefits on health accrue from physical activity characterized by the rhythmical contraction of large muscle groups that move the body over distance or against gravity. The activity can be performed at moderate intensity (50%-70% maximal oxygen capacity, i.e., at about "half-speed") and should be done at least every other day. Not known, however, is whether the health benefits are mediated through improvements in physical fitness or are achieved through some other pathway, such as improved serum lipoprotein profile, fibrinolytic activity, decreased platelet adherence, or other metabolic changes. Some health benefits seem to be achieved through activity that does not improve cardiorespiratory endurance.

10. **The promotion of physical activity in the U.S. population: the status of programs in medical, worksite, community, and school settings** (*12*). Exercise programs at the worksite, exercise recommendations or prescriptions by health-care providers, and physical education in the schools have potential for beneficially modifying exercise behaviors of large numbers of people of all ages. A community-based program to promote physical activity can provide support for behaviors triggered in the worksite, medical setting, or school programs and also may provide the primary contact for persons who may not otherwise be reached. Behavioral change seems most likely when these forums and others provide overlapping encouragement for the adoption and maintenance of regular exercise behavior. There is evidence that worksite programs, medical professionals, and schools favorably influence exercise behavior. However, the components of an effective program in any setting are unknown. "Success" may differ both between and within settings and depend on the program-specific objectives, which may not stem from health-related concerns. The community setting is the most complex and, to date, community-based programs have not demonstrated community-wide changes. Individuals responsible for programs need to establish clear objectives before initiating the program. Researchers need to help evaluate the individual programs and identify components of success across different programs.

RECURRENT TOPICS OF DISCUSSION

Conceptual issues. Physical activity, physical fitness, health, and disease are complex, multidimensional concepts that relate to each other via an equally complex array of demographic and cultural variables. Meaningful discussion of their interrelationships, causal or otherwise, requires that the specific dimension(s) under discussion be described as carefully as possible. The complexity of the potential interrelations should not deter investigation of these relationships or unduly hamper utilization of current knowledge. It does mean that future researchers should carefully consider and describe the component(s) of physical activity, fitness, or health with which they are concerned. Equally important, utilization and dissemination of information must be accurate lest unrealistic expectations be engendered.

Methodologic issues. Throughout the set of workshop papers, there is a repeated call for reliable and valid measurement instruments. The complexity of the concepts under study precludes the possibility that a single instrument will be suitable in all situations. What is needed

Physical Activity and Exercise — Continued

is (1) that the instrument be selected or developed with the specific dimensions of activity, health, or fitness to be studied firmly in mind and (2) that the accuracy of the instrument be determined.

Major gaps. In almost every paper, the paucity and necessity of dose-response information are mentioned. This should not be mistaken for the search for a single optimal level below which there is no benefit and above which one reaps full reward. On the contrary, the interest in dose-response information stems from the recognition that dose is probably inversely related to likelihood of participation and from the necessity to compare benefits and risks, both of which are almost certainly dose-related. The increase in benefits may be greatest at low levels and diminish with increasing activity. On the other hand, risks may be less at lower levels and become increasingly more frequent and severe at higher levels.

The effect of low-intensity activity, such as walking, is an area of great interest. It appears likely that the greatest gain in the risk-benefit relationship per unit change in physical activity occurs at the lower end of the activity spectrum (*11*). As a whole, the population is likely to benefit more if the least active begin to do a little than if the more active do even more. There

(Continued on page 181)

TABLE I. Summary—cases of specified notifiable diseases, United States

Disease	13th Week Ending			Cumulative, 13th Week Ending		
	Mar. 30, 1985	Mar. 31, 1984	Median 1980-1984	Mar. 30, 1985	Mar. 31, 1984	Median 1980-1984
Acquired Immunodeficiency Syndrome (AIDS)	388	53	N	1,597	876	N
Aseptic meningitis	79	98	79	887	1,039	1,022
Encephalitis: Primary (arthropod-borne & unspec.)	17	18	18	218	193	203
Post-infectious	5	4	2	30	22	22
Gonorrhea: Civilian	15,033	15,977	16,313	194,085	204,147	231,084
Military	459	530	485	4,689	5,094	6,782
Hepatitis: Type A	*20	421	483	5,175	5,277	5,974
Type B	467	485	463	5,983	6,005	4,998
Non A, Non B	85	55	N	1,003	848	N
Unspecified	106	80	166	1,253	1,104	2,122
Legionellosis	6	11	N	134	122	N
Leprosy	7	1	3	80	51	49
Malaria	11	18	18	159	150	192
Measles: Total*	207	85	76	551	643	643
Indigenous	117	72	N	388	561	N
Imported	90	13	N	163	82	N
Meningococcal infections: Total	53	74	80	782	887	887
Civilian	53	74	80	782	887	887
Military	-	-	-	-	-	5
Mumps	107	101	111	1,047	909	1,427
Pertussis	11	39	39	313	445	268
Rubella (German measles)	8	13	75	88	134	575
Syphilis (Primary & Secondary): Civilian	623	674	549	6,186	7,209	7,529
Military	6	5	7	44	85	96
Toxic Shock syndrome	6	11	N	88	104	N
Tuberculosis	375	489	489	4,574	4,869	5,827
Tularemia	1	3	2	23	16	23
Typhoid fever	7	3	15	55	80	90
Typhus fever, tick-borne (RMSF)	1	5	2	8	16	14
Rabies, animal	134	105	143	1,057	1,087	1,294

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1985		Cum. 1985
Anthrax	-	Plague	-
Botulism: Foodborne	1	Poliomyelitis: Total	1
Infant	9	Paralytic	1
Other	-	Psittacosis (Pa. 1, N.C. 1)	33
Brucellosis	10	Rabies, human	-
Cholera	-	Tetanus (Md. 1)	12
Congenital rubella syndrome	-	Trichinosis (Alaska 9)	20
Diphtheria	-	Typhus fever, flea-borne (endemic, murine)	3
Leptospirosis (W. Va. 1)	7		

*Five of the 207 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending March 30, 1985 and March 31, 1984 (13th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum 1985	1985	Cum 1985	Cum 1985	Cum 1985	Cum 1984	1985	1985	1985	1985	1985	Cum 1985
UNITED STATES	1,597	79	218	30	194,085	204,147	420	467	85	106	6	80
NEW ENGLAND	47	5	4	-	6,179	6,344	4	47	6	25	-	1
Maine	2	-	-	-	245	244	-	3	1	-	-	-
N.H.	-	2	2	-	128	154	-	-	-	-	-	-
Vt.	-	-	-	-	55	96	-	-	-	-	-	-
Mass.	29	3	2	-	2,365	2,424	2	36	2	23	-	1
R.I.	4	-	-	-	432	396	-	2	2	1	-	-
Conn.	12	-	-	-	2,954	3,030	2	6	1	1	-	-
MID ATLANTIC	668	9	34	-	25,878	27,836	24	54	3	1	-	7
Upstate N.Y.	92	3	14	-	3,909	4,237	6	9	2	1	-	-
N.Y. City	453	1	3	-	10,822	12,304	2	3	-	-	-	7
N.J.	74	-	9	-	5,742	4,326	2	25	-	-	-	-
Pa.	49	5	8	-	5,405	6,969	14	17	1	-	-	-
E.N. CENTRAL	93	10	55	7	28,296	28,545	15	50	7	4	1	1
Ohio	21	4	19	3	7,228	7,124	6	19	2	1	1	1
Ind.	4	1	11	-	2,807	3,217	-	14	1	1	-	-
Ill.	39	3	6	3	8,112	7,233	4	3	1	2	-	-
Mich.	17	2	16	-	8,098	7,863	5	14	2	-	-	-
Wis.	12	-	3	1	2,051	3,108	-	-	1	-	-	-
W.N. CENTRAL	14	3	20	3	9,943	9,668	9	15	7	-	-	-
Minn.	3	-	7	1	1,478	1,362	-	3	2	-	-	-
Iowa	2	2	8	-	1,081	1,115	2	-	1	-	-	-
Mo.	6	-	-	-	4,557	4,510	1	8	3	-	-	-
N. Dak.	-	-	-	1	77	108	-	-	-	-	-	-
S. Dak.	-	-	-	-	166	286	5	-	-	-	-	-
Nebr.	-	-	1	-	954	627	-	1	-	-	-	-
Kans.	3	1	4	1	1,630	1,660	1	3	1	-	-	-
S. ATLANTIC	182	18	24	12	42,543	51,348	40	110	15	12	3	1
Del.	5	-	1	-	897	838	-	1	-	-	2	-
Md.	23	1	7	1	6,397	6,361	2	23	3	1	1	-
D.C.	25	-	-	-	3,525	3,666	2	5	-	-	-	-
Va.	13	6	1	4	4,571	5,008	3	12	2	1	-	-
W. Va.	1	-	2	-	527	607	-	-	-	-	-	-
N.C.	13	1	10	-	8,411	8,361	4	10	-	3	-	1
S.C.	2	3	3	-	5,403	4,867	1	17	1	-	-	-
Ga.	31	-	-	-	-	9,860	3	12	-	-	-	-
Fla.	69	7	-	7	12,812	11,780	25	30	9	7	-	-
E.S. CENTRAL	10	6	8	3	17,150	16,865	11	29	2	1	-	-
Ky.	4	-	2	-	1,924	2,150	3	2	-	-	-	-
Tenn.	-	2	4	-	6,751	6,924	2	15	2	1	-	-
Ala.	5	4	2	3	5,263	5,200	5	10	-	-	-	-
Miss.	1	-	-	-	3,212	2,591	1	2	-	-	-	-
W.S. CENTRAL	120	8	19	-	28,064	27,931	75	26	8	26	-	10
Ark.	2	-	1	-	2,609	2,330	-	-	-	-	-	-
La.	15	-	-	-	5,947	6,301	-	4	-	-	-	1
Okla.	2	-	9	-	2,814	3,083	11	2	2	3	-	-
Tex.	101	8	9	-	16,694	16,217	64	20	6	23	-	9
MOUNTAIN	24	-	7	2	6,165	6,240	54	25	12	4	-	-
Mont.	-	-	-	-	197	284	-	-	-	-	-	-
Idaho	-	-	-	-	225	304	4	1	-	-	-	-
Wyo.	-	-	-	-	171	179	1	-	-	-	-	-
Colo.	6	-	3	-	1,711	1,778	-	-	-	-	-	-
N. Mex.	4	-	-	-	761	768	1	4	3	1	-	-
Ariz.	9	-	-	-	1,851	1,577	29	11	7	1	-	-
Utah	2	-	4	2	252	342	7	3	-	-	-	-
Nev.	3	-	-	-	997	1,008	12	6	2	2	-	-
PACIFIC	439	20	47	3	29,867	29,370	188	111	25	23	2	60
Wash.	18	3	3	-	2,064	2,084	17	6	5	2	-	8
Oreg.	9	-	-	-	1,624	1,663	40	19	5	-	-	2
Calif.	399	14	44	3	24,950	24,397	131	78	15	31	2	45
Alaska	2	-	-	-	754	716	-	1	-	-	-	-
Hawaii	11	3	-	-	475	510	-	7	-	-	-	5
Guam	-	U	-	-	6	73	U	U	U	U	U	-
P.R.	26	-	1	1	1,025	859	1	9	-	5	-	2
V.I.	1	-	-	-	103	106	-	1	-	-	-	-
Pac. Trust Terr.	-	U	-	-	-	-	U	U	U	U	U	-

N: Not notifiable U: Unavailable

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending March 30, 1985 and March 31, 1984 (13th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum. 1985	1985	Cum 1985	1985	Cum. 1985	Cum. 1984	Cum. 1985	1985	Cum. 1985	1985	Cum. 1985	Cum. 1984	1985	Cum. 1985	Cum. 1984
UNITED STATES	159	117	388	90	163	643	782	107	1,047	11	313	445	8	88	134
NEW ENGLAND	6	-	-	18	22	1	33	1	26	-	15	12	-	4	11
Maine	-	-	-	-	-	-	1	-	2	-	2	-	-	-	1
N.H.	-	-	-	-	-	1	3	-	4	-	8	3	-	1	-
Vt.	-	-	-	-	-	-	4	-	2	-	2	5	-	-	-
Mass.	3	-	-	18 §	22	-	7	1	15	-	2	3	-	3	10
R.I.	1	-	-	-	-	-	6	-	2	-	1	1	-	-	-
Conn.	2	-	-	-	-	-	12	-	1	-	-	-	-	-	-
MID ATLANTIC	26	9	26	2	8	17	131	18	115	1	41	24	-	15	4
Upstate N.Y.	13	5	15	-	1	-	60	10	74	-	18	14	-	5	2
N.Y. City	6	4	11	2 †§	5	10	14	1	12	-	7	1	-	7	1
N.J.	3	-	-	-	2	3	22	-	11	-	1	1	-	3	1
Pa.	4	-	-	-	-	4	35	7	18	1	15	8	-	-	-
E.N. CENTRAL	8	72	131	69	93	288	138	36	499	1	44	156	-	8	26
Ohio	2	-	-	-	13	2	51	9	165	-	13	28	-	-	1
Ind.	1	-	-	-	1	2	22	2	15	-	11	98	-	-	1
Ill.	-	68	72	66 § 3 †	66	51	24	9	82	-	3	11	-	2	17
Mich.	5	4	33		13	226	29	16	198	1	7	10	-	6	4
Wis.	-	-	26	-	-	7	12	-	39	-	10	9	-	-	3
W.N. CENTRAL	4	-	-	-	3	-	34	6	37	3	30	64	-	6	16
Minn.	1	-	-	-	1	-	9	-	-	-	10	3	-	-	1
Iowa	-	-	-	-	-	-	4	1	5	-	1	3	-	-	-
Mo.	1	-	-	-	2	-	18	-	5	1	8	12	-	-	-
N. Dak.	1	-	-	-	-	-	-	-	-	-	4	-	-	-	2
S. Dak.	1	-	-	-	-	-	1	-	-	-	-	1	-	-	-
Nebr.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
Kans.	-	-	-	-	-	-	2	5	27	2	7	43	-	6	13
S. ATLANTIC	22	7	16	-	3	6	147	2	73	2	73	50	-	10	14
Del.	-	-	-	-	-	-	3	-	1	-	-	-	-	-	-
Md.	5	-	-	-	1	-	19	-	10	-	14	3	-	1	-
D.C.	3	-	-	-	1	-	4	-	-	-	-	-	-	-	-
Va.	5	-	6	-	1	2	23	-	11	1	2	7	-	-	-
W. Va.	1	2	2	-	-	-	3	-	27	-	-	5	-	-	-
N.C.	2	-	-	-	-	-	21	1	7	-	6	17	-	-	-
S.C.	-	-	-	-	-	-	12	-	1	-	-	1	-	2	-
Ga.	1	5	5	-	-	-	21	-	2	-	36	5	-	4	2
Fla.	5	-	3	-	-	4	41	1	14	1	15	12	-	3	12
E.S. CENTRAL	3	-	-	-	-	3	37	-	6	-	3	2	-	1	1
Ky.	1	-	-	-	-	1	2	-	1	-	1	1	-	1	-
Tenn.	-	-	-	-	-	2	14	-	4	-	1	1	-	-	-
Ala.	2	-	-	-	-	-	12	-	-	-	1	-	-	-	1
Miss.	-	-	-	-	-	-	9	-	1	-	-	-	-	-	-
W.S. CENTRAL	7	1	3	-	-	87	69	12	92	-	14	52	3	13	5
Ark.	-	-	-	-	-	-	6	2	3	-	7	9	-	1	2
La.	-	-	-	-	-	-	13	-	-	-	1	1	-	-	-
Okla.	-	-	-	-	-	-	10	N	N	-	6	33	-	-	-
Tex.	7	1	3	-	-	87	40	10	89	-	-	9	3	12	3
MOUNTAIN	6	17	155	-	17	96	43	16	78	1	19	40	2	3	3
Mont.	-	-	101	-	17	-	3	-	4	-	2	16	-	-	-
Idaho	-	-	-	-	-	-	-	-	4	-	-	1	1	1	1
Wyo.	-	-	-	-	-	-	3	-	1	-	-	3	-	-	-
Colo.	2	-	-	-	-	-	11	-	10	-	8	12	-	-	-
N. Mex.	4	-	-	-	-	71	5	N	N	1	3	2	1	1	-
Ariz.	-	17	54	-	-	-	15	5	42	-	3	3	-	1	-
Utah	-	-	-	-	-	25	4	-	2	-	3	1	-	-	2
Nev.	-	-	-	-	-	-	2	11	15	-	-	2	-	-	-
PACIFIC	77	11	57	1	17	145	150	16	121	3	74	45	3	28	54
Wash.	6	-	1	-	1	28	25	4	9	2	11	8	-	-	1
Oreg.	4	-	-	-	-	-	17	N	N	1	16	5	-	2	-
Calif.	57	11	53	-	12	115	106	12	103	-	44	19	3	24	52
Alaska	1	-	-	-	-	-	2	-	2	-	1	-	-	-	-
Hawaii	9	-	3	1 †	4	2	-	-	7	-	2	13	-	2	1
Guam	-	U	7	U	-	75	-	U	-	U	-	-	U	-	1
P.R.	-	-	39	-	-	-	4	4	41	-	1	-	-	4	2
V.I.	-	-	4	-	5	-	-	-	3	-	-	-	-	-	-
Pac. Trust Terr.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending March 30, 1985 and March 31, 1984 (13th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1985	Cum. 1984	1985	Cum. 1985	Cum. 1984	Cum. 1985	Cum. 1985	Cum. 1985	Cum. 1985
UNITED STATES	8,186	7,209	6	4,574	4,869	23	55	8	1,057
NEW ENGLAND	135	154	1	156	134	-	4	-	-
Maine	5	1	-	13	8	-	-	-	-
N.H.	-	2	-	-	12	-	-	-	-
Vt.	-	-	-	1	2	-	-	-	-
Mass.	76	97	1	98	67	-	3	-	-
R.I.	4	7	-	16	14	-	-	-	-
Conn.	50	47	-	28	31	-	1	-	-
MID ATLANTIC	796	984	1	905	900	1	8	-	106
Upstate N.Y.	52	78	-	123	141	-	5	-	24
N.Y. City	504	575	-	487	368	1	-	-	-
N.J.	175	187	-	76	183	-	2	-	1
Pa.	65	144	1	219	208	-	1	-	81
E.N. CENTRAL	310	343	3	586	614	-	6	-	15
Ohio	29	53	2	107	126	-	2	-	1
Ind.	26	40	1	68	66	-	3	-	2
Ill.	161	134	-	261	247	-	1	-	2
Mich.	80	91	-	121	142	-	-	-	-
Wis.	14	25	-	29	33	-	-	-	10
W.N. CENTRAL	74	117	-	117	127	7	2	-	153
Minn.	19	24	-	19	20	1	2	-	25
Iowa	11	10	-	20	20	-	-	-	44
Mo.	28	68	-	54	55	5	-	-	9
N. Dak.	-	-	-	-	4	-	-	-	19
S. Dak.	4	-	-	5	5	-	-	-	43
Nebr.	3	4	-	7	9	1	-	-	9
Kans.	9	11	-	12	14	-	-	-	4
S. ATLANTIC	1,571	2,212	1	922	1,088	5	8	6	354
Del.	13	8	-	8	14	1	-	-	-
Md.	112	148	-	96	115	-	1	-	197
D.C.	84	78	-	38	34	-	-	-	-
Va.	86	118	-	69	103	-	1	-	45
W. Va.	2	8	-	21	43	-	-	-	3
N.C.	185	244	-	101	170	4	1	4	-
S.C.	208	205	-	115	117	-	-	1	12
Ga.	-	359	-	138	147	-	-	-	43
Fla.	881	1,044	1	336	345	-	5	1	54
E.S. CENTRAL	619	451	-	390	459	2	2	2	57
Ky.	20	26	-	60	107	-	-	-	10
Tenn.	156	106	-	127	137	2	-	1	11
Ala.	195	149	-	145	164	-	2	1	36
Miss.	248	170	-	58	51	-	-	-	-
W.S. CENTRAL	1,509	1,726	-	474	481	2	2	-	183
Ark.	79	65	-	32	43	1	-	-	25
La.	266	322	-	82	64	-	-	-	4
Okla.	45	55	-	58	57	1	-	-	26
Tex.	1,119	1,284	-	302	317	-	2	-	128
MOUNTAIN	220	170	-	89	107	4	1	-	77
Mont.	1	-	-	16	7	1	-	-	36
Idaho	2	8	-	2	5	-	-	-	-
Wyo.	4	1	-	1	-	-	-	-	2
Colo.	45	37	-	3	7	-	-	-	-
N. Mex.	28	24	-	18	28	1	1	-	1
Ariz.	125	65	-	41	45	-	-	-	38
Utah	3	6	-	3	8	2	-	-	-
Nev.	12	29	-	5	7	-	-	-	-
PACIFIC	952	1,052	-	935	959	2	22	-	112
Wash.	23	41	-	33	45	-	-	-	-
Oreg.	27	32	-	33	37	1	-	-	-
Calif.	885	955	-	785	802	1	22	-	112
Alaska	-	1	-	38	20	-	-	-	-
Hawaii	17	23	-	46	55	-	-	-	-
Guam	-	-	U	2	12	-	-	-	-
P.R.	240	227	-	75	75	-	1	-	8
V.I.	-	6	-	1	1	-	-	-	-
Pac. Trust Terr.	-	-	U	-	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending March 30, 1985 (13th Week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	695	491	134	40	19	11	77
Boston, Mass.	177	116	40	13	4	4	19
Bridgeport, Conn.	48	35	8	3	1	1	5
Cambridge, Mass.	18	12	4	2	-	-	1
Fall River, Mass.	28	21	5	1	-	1	1
Hartford, Conn.	45	26	10	6	1	2	6
Lowell, Mass.	25	17	5	-	3	-	5
Lynn, Mass.	22	17	1	2	2	-	-
New Bedford, Mass.	30	26	4	-	-	-	3
New Haven, Conn.	46	35	5	4	1	1	2
Providence, R.I.	87	61	19	2	3	2	11
Somerville, Mass.	15	12	1	2	-	-	4
Springfield, Mass.	53	32	17	2	2	-	3
Waterbury, Conn.	38	28	8	1	1	-	6
Worcester, Mass.	63	53	7	2	1	-	11
MID. ATLANTIC	2,842	1,897	596	229	59	61	140
Albany, N.Y.	55	39	5	3	2	6	1
Allentown, Pa.	17	10	5	2	-	-	-
Buffalo, N.Y.	130	96	22	6	5	1	8
Camden, N.J.	32	18	11	1	-	2	-
Elizabeth, N.J.	28	18	8	2	-	-	1
Erie, Pa.†	34	25	6	2	1	-	3
Jersey City, N.J.	39	23	9	3	1	3	-
N.Y. City, N.Y.	1,431	938	304	138	28	23	54
Newark, N.J.	66	35	14	10	3	4	7
Paterson, N.J.	24	13	7	4	-	-	4
Philadelphia, Pa.	494	346	96	31	10	11	35
Pittsburgh, Pa.†	61	32	18	3	2	6	-
Reading, Pa.	28	21	5	2	-	-	4
Rochester, N.Y.	128	88	29	8	3	-	11
Schenectady, N.Y.	29	24	3	2	-	-	1
Scranton, Pa.†	36	30	6	-	-	-	1
Syracuse, N.Y.	102	68	19	9	2	4	2
Trenton, N.J.	37	22	14	1	-	-	2
Utica, N.Y.	27	20	7	-	-	-	2
Yonkers, N.Y.	44	31	8	2	2	1	4
E.N. CENTRAL	2,354	1,661	386	147	63	96	104
Akron, Ohio	64	49	10	1	3	1	4
Canton, Ohio	43	34	8	1	-	-	6
Chicago, Ill. §	554	483	11	26	16	37	16
Cincinnati, Ohio	170	111	39	6	2	12	18
Cleveland, Ohio	190	111	46	16	8	9	7
Columbus, Ohio	120	72	26	12	5	5	5
Dayton, Ohio	101	58	26	8	3	6	3
Detroit, Mich.	253	157	52	32	6	6	6
Evansville, Ind.	47	36	11	-	-	-	1
Fort Wayne, Ind.	51	37	10	-	1	3	3
Gary, Ind.	6	3	2	1	-	-	-
Grand Rapids, Mich.	79	57	17	3	2	-	3
Indianapolis, Ind.	157	93	33	16	6	9	-
Madison, Wis.	52	33	10	7	2	-	5
Milwaukee, Wis.	129	95	25	6	1	2	7
Peoria, Ill.	53	43	5	4	1	-	3
Rockford, Ill.	49	39	8	-	1	1	3
South Bend, Ind.	53	41	8	2	-	2	6
Toledo, Ohio	116	85	21	4	4	2	6
Youngstown, Ohio	67	44	18	2	2	1	2
W.N. CENTRAL	721	503	135	36	27	20	45
Des Moines, Iowa	58	40	13	3	2	-	7
Duluth, Minn.	29	19	8	-	1	1	2
Kansas City, Kans.	25	17	3	2	2	1	-
Kansas City, Mo.	108	70	25	6	6	1	8
Lincoln, Nebr.	28	20	4	2	1	1	2
Minneapolis, Minn.	88	60	17	3	4	4	3
Omaha, Nebr.	106	68	23	10	4	1	12
St. Louis, Mo.	152	115	20	6	5	6	3
St. Paul, Minn.	55	44	8	1	1	1	1
Wichita, Kans.	72	50	14	3	1	4	7
S. ATLANTIC	1,390	879	299	130	37	42	73
Atlanta, Ga.	142	78	39	18	4	3	2
Baltimore, Md.	259	169	62	15	9	4	6
Charlotte, N.C.	82	54	16	4	6	2	9
Jacksonville, Fla.	104	61	29	9	1	4	11
Miami, Fla.	110	76	22	8	3	1	2
Norfolk, Va.	69	42	16	3	1	7	9
Richmond, Va.	85	53	21	5	1	5	9
Savannah, Ga.	48	30	10	3	2	3	5
St. Petersburg, Fla.	116	100	11	3	1	1	8
Tampa, Fla.	84	46	18	11	3	3	5
Washington, D.C.	263	150	49	49	6	9	5
Wilmington, Del.	28	20	6	2	-	-	2
E.S. CENTRAL	789	480	220	52	22	15	61
Birmingham, Ala.	142	74	48	11	5	4	5
Chattanooga, Tenn.	72	52	12	5	2	1	9
Knoxville, Tenn.	69	37	24	6	2	-	6
Louisville, Ky.	121	78	28	4	7	4	12
Memphis, Tenn.	151	94	42	12	1	2	17
Mobile, Ala.	54	31	19	2	2	-	3
Montgomery, Ala.	55	42	11	2	-	-	1
Nashville, Tenn.	125	72	36	10	3	4	8
W.S. CENTRAL	1,397	938	252	98	56	53	76
Austin, Tex.	50	29	8	6	2	5	2
Baton Rouge, La.	30	16	8	3	2	1	-
Corpus Christi, Tex.	67	38	17	6	3	3	-
Dallas, Tex.	208	101	63	26	8	10	5
El Paso, Tex.	72	48	13	7	3	1	10
Fort Worth, Tex.	120	69	30	12	4	5	4
Houston, Tex. §	354	313	4	8	17	12	12
Little Rock, Ark.	60	33	16	4	6	1	10
New Orleans, La.	85	62	14	6	1	2	-
San Antonio, Tex.	170	105	41	10	5	9	16
Shreveport, La.	78	59	13	3	2	1	8
Tulsa, Okla.	103	65	25	7	3	3	9
MOUNTAIN	597	382	115	47	33	30	31
Albuquerque, N.Mex.	78	52	13	7	5	1	7
Colo. Springs, Colo.	14	10	3	1	-	-	2
Denver, Colo.	111	55	27	15	3	11	4
Las Vegas, Nev.	73	48	17	4	3	1	4
Ogden, Utah	18	13	4	-	-	1	1
Phoenix, Ariz.	133	89	20	8	10	6	2
Pueblo, Colo.	14	10	3	1	-	-	2
Salt Lake City, Utah	57	34	10	2	2	9	2
Tucson, Ariz.	99	71	18	9	-	1	7
PACIFIC	2,353	1,536	484	192	89	48	144
Berkeley, Calif.	25	17	4	4	-	-	-
Fresno, Calif.	83	52	20	3	4	4	8
Glendale, Calif.	42	31	7	1	1	-	3
Honolulu, Hawaii	87	54	22	5	2	4	3
Long Beach, Calif.	104	69	24	7	3	1	4
Los Angeles, Calif.	777	491	168	74	35	5	25
Oakland, Calif.	94	62	15	8	3	6	4
Pasadena, Calif.	40	30	4	2	3	1	7
Portland, Oreg.	160	118	26	7	5	4	12
Sacramento, Calif.	150	100	29	10	9	2	6
San Diego, Calif.	189	105	35	19	7	3	23
San Francisco, Calif.	154	105	28	14	2	5	5
San Jose, Calif.	183	116	46	14	6	1	19
Seattle, Wash.	130	77	25	17	7	4	4
Spokane, Wash.	69	51	13	3	2	-	9
Tacoma, Wash.	86	58	18	4	-	6	12
TOTAL	13,138††	8,767	2,621	971	395	374	751

* Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

** Pneumonia and influenza.

† Because of changes in reporting methods in these 4 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†† Total includes unknown ages.

§ Data not available. Figures are estimates based on average of past 4 weeks.

Physical Activity and Exercise — Continued

may be different levels at which the rate of improvement diminishes for different diseases. Although low-level activity is a particularly important area for study, it is, unfortunately, also the place at which current measurement instruments are least discriminatory.

Another frequently mentioned deficiency of currently available data is the lack of information pertaining to specific subgroups within the population, such as children and adolescents, elderly, the disabled, and others. Not all individuals are likely to achieve equal benefit from an activity program. Some groups of persons are more likely to become injured than others, and some are more likely to respond favorably to a specific intervention than others. Overall, greater attention to the differing effects on population subgroups is very important. In particular, the patterns and determinants of childhood and youth physical activity and the behavioral patterns that are more likely to carry over into adulthood should be ascertained.

The near absence of data about secular trends in physical activity patterns at the national level is not surprising given the relatively recent interest in this area shown by the public health community. The few data available from national surveys in Canada, opinion polls in the United States, and studies of selected groups suggest a recent increase in leisure-time physical activities (*5,13*). However, the increase cannot be quantified and may not apply to all groups. It is hoped that future surveillance systems will address these issues with a more systematic and quantitative approach.

Miscellaneous. A recurrent theme of discussion was that the benefits and risks cannot be considered in isolation. It may be necessary to study them separately, but the overall effect of physical activity on the health of the population requires that both be known, studied with equal care, and considered objectively. The potential overall beneficial impact of physical activity on health will be poorly served if activity patterns are recommended indiscriminately for all groups without regard for the subgroup-specific benefits and risks.

Reported by Behavioral Epidemiology and Evaluation Br, Div of Health Education, Center for Health Promotion and Education, CDC.

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Epidemiologic Notes and Reports

Contact Spread of Vaccinia from a National Guard Vaccinee — Wisconsin

On January 24, 1985, a 15-year-old female was referred to a dermatologist in a clinic in La Crosse, Wisconsin, for evaluation of an ulcerated lesion on her left upper lip. On examination, the patient had a 2-cm diameter ulcer on her left upper lip, five 4-mm diameter oval vesicles on the arms, and marked conjunctival injection of the left eye. She appeared mildly sick with low-grade fever, fatigue, and tender cervical lymphadenopathy. The patient was otherwise in good health, with no history of eczema, malignancy, or immunologic deficiency.

The patient has a male friend who is a member of the Wisconsin National Guard. He had received a smallpox vaccination in a U.S. Army facility in Wisconsin at the end of December 1984. In early January, the patient assisted her friend in applying compresses to ease the discomfort of a successful smallpox vaccination. As a child, the patient had received a smallpox vaccination but had never developed a reaction. She has no scar compatible with smallpox vaccination.

She was treated with trifluridine in the left eye, oral erythromycin, and topical neosporin for the ulcer on her lip. In addition, she received a total of 30 ml of vaccinia immune globulin (VIG) intramuscularly over 2 days. Vaccinia virus was cultured from the skin lesions. On follow-up visit on February 6, all lesions were healing well, and it appeared that the lesion on the left lip would heal without scarring.

An investigation conducted to determine whether the patient had transmitted disease to her contacts involved five immediate family members and 45 participants in a girls' gymnastics meet on January 21 in which the patient competed. By January 31, none of these 50 individuals had subsequent evidence of vesicular or pustular skin lesions.

Reported by JC Baumgaertner, MD, R Hogan, MD, C Born, MD, Gundersen Clinic, LaCrosse, J Berg, JP Davis, MD, State Epidemiologist, Wisconsin Dept of Health and Social Svcs; Div of Viral Diseases, Center for Infectious Diseases, International Health Program Office, CDC.

Editorial Note: Since the successful global eradication of smallpox, smallpox vaccinations of civilians in the United States have decreased to several hundred a year. Smallpox vaccine is now recommended only for laboratory workers occupationally exposed to orthopox viruses (*1*).

The U.S. Department of Defense (DOD) routinely vaccinates all active-duty personnel and members of the National Guard and Reserves on entry into military service and every 5 years thereafter. Under current policy guidelines, several hundred thousand DOD personnel are vaccinated against smallpox each year. In line with World Health Organization recommendations (*2*), the DOD policy recommends vaccination of military personnel in circumstances that would limit the potential contact between recent military vaccinees and potentially unprotected civilian contacts. For example, smallpox vaccinations are given during basic training and,

Vaccinia — Continued

for the National Guard, are recommended at the start of extended training activities, such as 2-week summer training. Contact spread of vaccinia from recently vaccinated military personnel has occurred in Canada (*3*) and Louisiana (*4*).

Apparently, this case resulted because of an incomplete application of this policy. The National Guard member was not vaccinated at the start of an extended training period. Although this patient's illness was relatively benign, the potential for serious or fatal complications would have been much greater if she had had eczema or immunologic deficiency because of malignancy or chemotherapy.

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Update: Influenza Activity — United States

Surveillance data indicate a continued decline of national influenza morbidity and mortality. For the week ending March 30, 1985, no state reported widespread outbreaks of influenza-like illness, and one state (Virginia) reported regional outbreaks. Of total deaths reported by 121 cities for the same week, 5.7% were associated with pneumonia or influenza, compared with the 7.3% of total deaths that were associated with pneumonia or influenza for the peak weeks of the season.

Influenza type B viruses have been isolated from students and teachers during two outbreaks in Hawaiian elementary schools. The first outbreak began on March 7 and continued for approximately a week, resulting in an increase in the school absentee rate from 5% to 15%-20%. Influenza type B virus was isolated from four students who were ill during this outbreak. The second outbreak occurred among a group of children from four classrooms of an elementary school that had toured the island of Hawaii from March 13 through March 15 in two large motor buses. One child had left the tour on March 15 with a high fever and sore throat. Throat cultures from the ill student were negative for bacteria, and viral testing was not attempted. Soon after they returned home, an outbreak of influenza-like illness began in the two classes that had traveled on the bus with the ill student; classroom absentee rates exceeded 50%. Less illness occurred in the two classes that had traveled on the other bus, but their absentee rates were also above normal. Influenza type B was isolated from two students and a teacher who traveled with the ill student. These are the first reports of documented outbreaks of type B influenza in the United States this season.

Reported by C Ibara, G Kunimoto, S Naka, G Kobayashi, A Liang, MD, State Epidemiologist, Hawaii Dept of Health; Participating physicians of the American Academy of Family Physicians; State and Territorial Epidemiologists; State Laboratory Directors; Other collaborating laboratories; Statistical Svcs Br, Div of Surveillance and Epidemiologic Studies, Div of Field Svcs, Epidemiology Program Office, WHO Collaborating Center for Influenza, Influenza Br, Div of Viral Diseases, Center for Infectious Diseases, CDC.

Notice to Readers

Reported Measles Cases — United States, Past 4 Weeks

Beginning with this issue of *MMWR*, a listing of states that have reported measles cases during the past 4 weeks will appear; New York City and the District of Columbia will also be included, if appropriate. It is hoped that this will enable areas with current measles cases to more accurately link their cases epidemiologically with recent known measles activity.

The following states have reported measles during the past 4 weeks: Arizona, California, Florida, Hawaii, Indiana, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Jersey, upstate New York, Ohio, Texas, Virginia, Washington, and Wisconsin; New York City has also reported measles.

The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238.

The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: ATTN: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333.

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